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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/865,797	05/25/2001	Michael A. Corrigan	IO-1058-US	4375

24923 7590 11/27/2002

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EXAMINER

SAN MARTIN, EDGARDO

ART UNIT PAPER NUMBER

2837

DATE MAILED: 11/27/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/865,797

Applicant(s)

CORRIGAN ET AL.

Examiner

Edgardo San Martin

Art Unit

2837

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 25 May 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-60 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-60 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Specification*

1. The disclosure is objected to because of the following informalities:
  - The first line of the Abstract is redundant, "The present invention provides";
  - In Page 7, Line 9 of the Specification, the reference character "116" should read - - 114 - -.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1 – 3, 5, 9, 12, 48, 50, 52, 56, 59 are rejected under 35 U.S.C. 102(b) as being anticipated by Crump et al. (US 3,911,388).

With respect to Claims 1 and 48, Crump et al. teach an apparatus for sensing seismic waves in the earth (Fig.3), the apparatus comprising a housing (Fig.3, Item 41),

one seismic sensor (Fig.3, Item 51) disposed in the housing; and at least one isolator (Fig.4, Items 109 and 111) coupled to the one or more seismic sensors for isolating the seismic sensor from high-g shock induced in the housing (Col.3, Lines 25 – 29, Col.7, Lines 32 – 61).

With respect to Claims 2 and 50, Crump et al. teach wherein the at least one isolator is disposed to provide isolation from the induced vibrations in at least one predetermined direction (Fig.4).

With respect to Claim 3, Crump et al. teach further comprising an electronics package (Fig.4, Item 81) disposed in the housing and wherein the at least one sensor form at least a portion of the electronic package (Fig.4).

With respect to Claims 5 and 52, Crump et al. teach wherein the at least one isolator further comprises a layer of silicone rubber (Fig.4, Items 109 and 111; Col.3, Lines 25 – 29 and Col.5, Lines 27 – 30).

With respect to Claims 9 and 56, Crump et al. teach wherein the sensor is an accelerometer (Col.4, Line 65 +).

With respect to Claims 12, 13 and 59, Crump et al. teach further comprising a cap (Fig.3, Item 43) coupled to the housing, the cap having a feedthrough for providing conductor (Fig.3, Item 15 access to the seismic sensor, and wherein the cap and housing are coupled to form a sealed sensor module.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 4, 6, 7, 51, 53 and 54 is rejected under 35 U.S.C. 103(a) as being unpatentable over Crump et al. (US 3,911,388) in view of Carpenter et al. (US 5,463,193).

With respect to Claims 4 and 51, Crump et al. teach the limitations discussed in the previous rejection, but fail to disclose wherein the at least one predetermined direction further comprises directions along three translational axes and three angular axes.

On the other hand, Carpenter et al. teach a vibration isolation system wherein the isolation system isolate a device in directions along three translational axes and three angular axes (Fig.1; Col.1, Lines 32 – 58).

It would have been obvious to a person with ordinary skill in the art to employ the Carpenter et al. vibration isolation configuration with the Crump et al. sensor system because the sensor would be isolated from vibration coming from all direction making

the sensor more sensitive to the seismic vibration, making the sensor system more reliable.

With respect to Claims 6 and 53, Carpenter et al. teach a vibration damper comprising polyurethane (Col.2, Line 33 +).

With respect to Claims 7 and 54, the Examiner takes Official Notice that it is well known in the art to employ silicone rubber and polyurethane foam as vibration dampers as disclosed by Crump et al. and Carpenter et al.

It have been obvious to a person with ordinary skill in the art to employ a vibration isolator comprising a layer of silicone rubber and a second layer of polyurethane foam because they are very well known vibration dampers elements and would be obvious to employ them in combination to increase the vibration damping effect.

4. Claims 8, 14 -16, 18, 20, 24 - 28, 32 - 35, 37, 39, 45 - 47, 49, 55 and 60 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crump et al. (US 3,911,388) in view of Hall, Jr. (US 4,163,206).

With respect to Claims 8, 15, 27, 35, 49 and 55, Crump et al. teach the limitations discussed in a previous rejection, but fail to disclose further comprising an inertial mass operatively associated with the sensor.

Nevertheless, Hall, Jr. teaches a seismic detector comprising an inertial mass (Fig.2, Item 36) operatively associated with the sensor (Fig.2, Item 15).

It would have been obvious to a person with ordinary skill in the art to employ the Hall, Jr. inertial mass with the Crump et al. sensor because of the nature of an accelerometer; an inertial mass is needed in some designs for the accelerometer to work properly.

With respect to Claims 14, 26, 34, 47 and 60, Hall, Jr. teaches wherein the sealed sensor module is hermetically sealed (Col.4, Lines 19 – 21).

With respect to Claims 16, 18 and 37, Crump et al. teach wherein the at least one isolator is disposed to provide isolation from the induced vibrations in at least one predetermined direction (Fig.4).

With respect to Claims 20 and 39, Crump et al. teach wherein the at least one isolator further comprises a layer of silicone rubber (Fig.4, Items 109 and 111; Col.3, Lines 25 – 29 and Col.5, Lines 27 – 30).

With respect to Claims 24, 25, 32, 33, 45 and 46, Crump et al. teach further comprising a cap (Fig.3, Item 43) coupled to the housing, the cap having a feedthrough for providing conductor (Fig.3, Item 15) access to the seismic sensor, and wherein the cap and housing are coupled to form a sealed sensor module.

With respect to Claim 28, Hall, Jr. teaches wherein the inertial mass is of metal (Col.4, Lines 41+).

5. Claims 10, 11, 57 and 58 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crump et al. (US 3,911,388) in view of Alft et al. (US 6,315,062).

Crump et al. teach the limitations discussed in a previous rejection, but fail to disclose wherein the one or more accelerometer sensors are three accelerometers disposed to provide three orthogonal axes of sensitivity, and wherein the one or more accelerometers are MEMS accelerometers.

On the other hand, Alft et al. teach a sensor system employing one or more accelerometer sensors that are three accelerometers disposed to provide three orthogonal axes of sensitivity, and wherein the one or more accelerometers are MEMS accelerometers (Col.9, Lines 4 – 40).

It would have been obvious to a person with ordinary skill in the art to employ the Alft et al. multiple MEMS accelerometers with the Crump et al. design because the MEMS accelerometers are smaller in size and could be placed at any adequate place without increasing the size of the element.

6. Claims 17, 23, 29 – 31 and 42 - 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crump et al. (US 3,911,388) in view of Hall, Jr. (US 4,163,206), and further in view of Alft et al. (US 6,315,062).

Crump et al. and Hall, Jr. teach the limitations discussed in a previous rejection, but fail to disclose wherein the one or more accelerometer sensors are three accelerometers disposed to provide three orthogonal axes of sensitivity, and wherein the one or more accelerometers are MEMS accelerometers.



On the other hand, Alft et al. teach a sensor system employing one or more accelerometer sensors that are three accelerometers disposed to provide three orthogonal axes of sensitivity, and wherein the one or more accelerometers are MEMS accelerometers (Col.9, Lines 4 – 40).

It would have been obvious to a person with ordinary skill in the art to employ the Alft et al. multiple MEMS accelerometers with the Crump et al. design because the MEMS accelerometers are smaller in size and could be placed at any adequate place without increasing the size of the element.

7. Claims 19, 21, 22, 38, 40 and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crump et al. (US 3,911,388) in view of Hall, Jr. (US 4,163,206), and further in view of Carpenter et al. (US 5,463,193).

With respect to Claims 19 and 38, Crump et al. and Hall, Jr. teach the limitations discussed in the previous rejection, but fail to disclose wherein the at least one predetermined direction further comprises directions along three translational axes and three angular axes.

On the other hand, Carpenter et al. teach a vibration isolation system wherein the isolation system isolate a device in directions along three translational axes and three angular axes (Fig.1; Col.1, Lines 32 – 58).

It would have been obvious to a person with ordinary skill in the art to employ the Carpenter et al. vibration isolation configuration with the Crump et al. sensor system

because the sensor would be isolated from vibration coming from all direction making the sensor more sensitive to the seismic vibration, making the sensor system more reliable.

With respect to Claims 21 and 40, Carpenter et al. teach a vibration damper comprising polyurethane (Col.2, Line 33 +).

With respect to Claims 22 and 41, the Examiner takes Official Notice that it is well known in the art of vibration dampers to employ multiple layers of damping materials or combination of them.

It would have been obvious to a person with ordinary skill in the art as to employ the Crump et al. silicone rubber in combination with the Carpenter et al. polyurethane foam because they are well known damping materials and would increase the efficiency of the element to damp vibrations.

### ***Conclusion***

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Pearce teaches an acoustic sensor and array thereof, Owen teaches a three-component borehole wall-locking seismic detector, Kamata et al. teach a downhole seismic exploration device and apparatus, Armstrong et al. teach hydrophones and similar devices, Peterson et al. teach an accelerometer with integral bi-directional shock protection and controllable viscous damping, Fiske, jr. teaches an

Art Unit: 2837

acceleration-responsive apparatus for sensing firing instant of an air gun, and Armine et al. teach an intruder detecting security system, Hersh et al. and Meyer et al. teach the use in combination of silicon rubber and polyurethane.

***Contact Information***

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Edgardo San Martin whose telephone number is (703) 308-1050. The examiner can normally be reached on 8:00AM - 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Nappi can be reached on (703) 308-3370. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-3431 for regular communications and (703) 305-3431 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

Edgardo San Martín  
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November 25, 2002

  
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